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Title: Specificity and sensitivity of mannitol challenge testing for asthma in young adults from the Western Australian Pregnancy (Raine study) Cohort

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Body: Introduction: Bronchial provocation testing is used clinically to diagnose asthma and investigate asthma in patients with normal spirometry and bronchodilator reversibility entering defence forces or participating in sports like SCUBA diving. Mannitol may have greater specificity than direct broncho-provocation agents like methacholine for diagnosing asthma, as it directly reflects presence of airways inflammation. Currently data is limited for the use of mannitol to detect asthma in a general community cohort. Aims: To quantify specificity, sensitivity, positive and negative predictive values of mannitol challenge testing for detecting asthma in a general population of young adults. Methods: 21-23 year old Raine study participants completed a mannitol challenge test and answered questions about asthmatic status. The mannitol challenge test involved inhaling a cumulative dose up to 635mg mannitol over 9 stages. A 15% fall in FEV₁ from baseline or 10% fall between doses defined a positive test. Current asthma was diagnosed if participants reported asthma symptoms and use of asthma medication(s) in the past 12 months. Results: To date, of 403 participants, 340 completed questionnaires and mannitol challenge test. 49 (14.4%) participants had current asthma and 20 (5.9%) a positive mannitol test. Specificity of the mannitol challenge test for detecting asthma was 72.3%, sensitivity was 13.7%, the positive predictive value was 43.8% and negative predictive value was 88%. Conclusion: This study confirms that mannitol challenge testing has high specificity and negative predictive value to detect asthma in a general population of young adults.